
Curriculum Vitae
Yuegang Zhang

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EDUCATION

Ph.D. Materials Science & Engineering, University of Tokyo (Oct. 1993 - Sept. 1996)
M.S. Physics, Tsinghua University (Sept. 1986 - June 1989)
B.S. Physics, Tsinghua University (Sept. 1981 - July 1986)

EMPLOYMENT

Aug. 2008 – present
Staff Scientist (Career), Lawrence Berkeley National Laboratory (Berkeley, CA, USA)

July 2002 – Aug. 2008
Senior Researcher, Intel Corporation (Santa Clara, CA, USA)
Chair, Memory Strategic Research Sector, Semiconductor Technology Committee (05 -08)
Project leader, Nanotube Strategic Research Project, Intel Research (02 - 05)

Jan. 2000 – July 2002
Research Associate, Department of Chemistry, Stanford University (Stanford, CA, USA)
(also affiliated with Molecular Nanosystems Inc. during Sept. 2001 – July 2002)

Oct. 1996 – Jan. 2000
Researcher, Fundamental Research Laboratories, NEC Corporation (Tsukuba, Japan)

Aug. 1989 – Sept. 1993
Lecturer/Assistant Professor, Department of Physics, Tsinghua University (Beijing, China)

HONORS AND SERVICES:

- 2003 – present: Member of Emerging Research Devices (ERD) and Emerging Research Materials (ERM) Working Groups of International Technology Roadmap for Semiconductors (ITRS).
- 2006 – 2008: Member of Technical Advisory Board of Memory Technologies, Semiconductor Research Corporation (SRC).
- 1998 – present: Referee for *Appl. Phys. Lett.*; *J. Appl. Phys.*; *Nano Lett.*; *J. Mater. Res.*; *J. Mater. Sci.*; *J. Am. Chem. Soc.*; *J. Phys. Chem.*; *Optics Comm.*; *NSF*; *IEEE Trans. Electronic Devices*; *IEEE Trans. Nanotech.*; *Appl. Surf. Sci.*; *Nano Research*; *ACS Nano*.
- 2000 – 2001: Postdoc Fellowship, Stanford University.
- 1995 – 1996: Research Fellowship of the Japan Society for the Promotion of Science (JSPS) for Young Scientists.
- 1995: Excellent Poster Award at International Symposia on Advanced Materials and Technology.
- 1991: Tsinghua University “12.9” Award for Young Teachers.

PATENTS

24 issued US patents; 5 issued Japan patents.

List of issued US patents:

1. 7,795,035 Determination of carbon nanotube concentration in a solution by fluorescence measurement
2. 7,692,249 End functionalization of carbon nanotubes
3. 7,629,639 Nanotube- and nanocrystal-based non-volatile memory
4. 7,456,052 Thermal intermediate apparatus, systems, and methods
5. 7,442,339 Microfluidic apparatus, Raman spectroscopy systems, and methods for performing molecular reactions
6. 7,368,791 Multi-gate carbon nano-tube transistors
7. 7,349,085 Detecting the orientation of carbon nanotubes
8. 7,335,258 Functionalization and separation of nanotubes and structures formed thereby
9. 7,316,982 Controlling carbon nanotubes using optical traps
10. 7,315,374 Real-time monitoring optically trapped carbon nanotubes
11. 7,262,991 Nanotube- and nanocrystal-based non-volatile memory
12. 7,259,344 Application of static light to a fluid of CNTs for purposes of sorting the CNTs
13. 7,168,484 Thermal interface apparatus, systems, and methods
14. 7,126,207 Capacitor with carbon nanotubes
15. 7,118,941 Method of fabricating a composite carbon nanotube thermal interface device
16. 7,026,562 Protected switch and techniques to manufacture the same
17. 6,974,926 Sorting of single-walled carbon nanotubes using optical dipole traps
18. 6,972,467 Multi-gate carbon nano-tube transistors
19. 6,936,780 Protected switch and techniques to manufacture the same
20. 6,924,003 Method of processing a nanotube using a selective solid state reaction
21. 6,855,659 Manufacturing method of carbon nanotubes and laser irradiation target for the manufacture thereof
22. 6,837,928 Electric field orientation of carbon nanotubes
23. 6,825,428 Protected switch and techniques to manufacture the same
24. 6,203,864 Method of forming a heterojunction of a carbon nanotube and a different material, method of working a filament of a nanotube

List of issued Japan patents:

1. Y. Zhang, "Formation of heterojunction in carbon nanotube", Japan Patent No. 2904346.
2. Y. Zhang, K. Suenaga, S. Iijima, C. Colliex, "Nanocable and its manufacture", Japan Patent No. 3769405.
3. Y. Zhang, S. Iijima, "Filament and method for inducing electric current in the same and method for processing the same", Japan Patent No. 3518422.
4. Y. Zhang, "Fabrication method and laser-target for carbon nanotubes", Japan Patent No. 3422302.
5. Y. Zhang, "Processing method for carbon nanotubes", Japan Patent No. 3353768.

PUBLICATIONS**Journal Articles:**

- (1) G. Xu, C. M. Torres, Jr., E. B. Song, J. Tang, J. Bai, X. Duan, Y. Zhang*, and K. Wang, "Enhanced conductance fluctuation by quantum confinement effect in graphene nanoribbons", *Nano Letters* 10, 4590–4594 (2010).
- (2) N. Tayebi, Y. Zhang*, R. J. Chen, Q. Tran, R. Chen, Y. Nishi, Q. Ma, and V. Rao, "An ultraclean tip-wear reduction scheme for ultrahigh density scanning probe-based data storage", *ACS Nano* 4, 5713–5720 (2010).
- (3) G. Xu, J. Bai, C. M. Torres, Jr., E. B. Song, J. Tang, Y. Zhou, X. Duan, Y. Zhang, and K. L. Wang, "Low-noise submicron channel graphene nanoribbons", *Applied Physics Letters* 97, 073107 (2010).
- (4) G. Xu, C. M. Torres Jr., Y. Zhang*, F. Liu, E. B. Song, M. Wang, Y. Zhou, C. Zeng, and K. L. Wang, "Effect of spatial charge inhomogeneity on 1/f noise behavior in graphene", *Nano Letters* 10, 3312-3317 (2010).
- (5) A. Ismach, C. Druzgalski, S. Penwell, Adam Schwartzberg, M. Zheng, A. Javey, J. Bokor, Y. Zhang*, "Direct chemical vapor deposition of graphene on dielectric surfaces", *Nano Letters* 10, 1542-1548 (2010).
- (6) M. Zheng, K. Takei, B. Hsia, H. Fang, X. Zhang, N. Ferralis, H. Ko, Y. Chueh, Y. Zhang, R. Maboudian, and A. Javey, "Metal-catalyzed crystallization of amorphous carbon to graphene", *Applied Physics Letters* 96, 063110 (2010).
- (7) N. Tayebi, Y. Narui, N. Franklin, C. P. Collier, K. P. Giapis, Y. Nishi, and Y. Zhang*, "Fully inverted single-digit nanometer domains in ferroelectric films", *Applied Physics Letters* 96, 023103 (2010).
- (8) J. R. McDonough, J. W. Choi, Y. Yang, F. La Mantia, Y. Zhang*, and Y. Cui, "Carbon nanofiber supercapacitors with large areal capacitances", *Applied Physics Letters* 95, 243109 (2009).
- (9) X. Liang, A. S. P. Chang, Y. Zhang, B. D. Harteneck, H. Choo, D. L. Olynick, and S. Cabrini, "Electrostatic force assisted exfoliation of prepatterned few-layer graphenes into device sites", *Nano Letters* 9, 467-472 (2009).
- (10) N. Teyabi, Y. Narui, R. Chen, C. P. Collier, K. Giapis, Y. Zhang*, "Nanopencil as a wear-tolerant probe for ultrahigh density data storage", *Applied Physics Letters* 93, 103112 (2008).
- (11) D. Ielmini and Y. Zhang, "Evidence for trap-limited transport in the sub-threshold conduction regime of chalcogenide glasses", *Applied Physics Letters* 90, 192102 (2007).
- (12) D. Ielmini and Y. Zhang, "Analytical model for sub-threshold conduction and threshold switching in chalcogenide-based memory devices", *Journal of Applied Physics* 102, 054517 (2007).
- (13) D. Ielmini and Y. Zhang*, "Physics-based analytical model of chalcogenide-based memories for array simulation", *IEDM (International Electron Devices Meeting) Technical Digest*, 401-404, 2006.
- (14) Y. Zhang*, "Carbon nanotube based nonvolatile memory devices" (invited review paper), *International Journal of High Speed Electronics and Systems*, 16, 959-975 (2006).
- (15) J. Guo, E. Kan, U. Ganguly, Y. Zhang, "High sensitivity and nonlinearity of carbon nanotube charge-based sensors", *Journal of Applied Physics* 99, 084301 (2006).

- (16) R. J. Chen and Y. Zhang*, “Controlled precipitation of solubilized carbon nanotubes by delamination of DNA”, *Journal of Physical Chemistry B* 110, 54-57 (2006).
- (17) U. Ganguly, J. Guo, E. Kan, Y. Zhang*, “Carbon nanotube based non-volatile memory and charge sensors” (Invited paper), *Proceedings of SPIE*, Vol. 6003, 60030H (2005).
- (18) R. J. Chen, M. P. Stewart, and Y. Zhang*, “Chondroitin sulfate wrapped single-walled carbon nanotubes as a versatile scaffold for solubilization” (to be submitted).
- (19) U. Ganguly, E. Kan, Y. Zhang*, “Few electron nano-floating gate memory device based on carbon nanotube field effect transistor” *Applied Physics Letters* 87, 043108 (2005).
- (20) S. Tan, H. Lopez, Y. Zhang*, “In-situ Raman and fluorescence monitoring of optically trapped single-walled carbon nanotubes” (Invited paper), *Proceedings of SPIE*, Vol. 5593, 73-81 (2004).
- (21) S. Tan, H. A. Lopez, C. W. Cai, Y. Zhang*, “Optical trapping of single-walled carbon nanotubes”, *Nano Letters* 4, 1415-1419 (2004).
- (22) Y. Zhang, Y. Li, W. Kim, D. Wang, H. Dai, “Imaging as-grown single-walled carbon nanotubes originated from isolated catalytic nanoparticles”, *Applied Physics A* 74, 325-328 (2002).
- (23) A. Goldoni, R. Larciprete, L. Gregoratti, B. Kaulich, M. Kiskinova, Y. Zhang, H. Dai, L. Sangaletti and F. Parmigiani, “X-ray photoelectron microscopy of the C1 score level of free-standing single-wall carbon nanotube bundles”, *Applied Physics Letters* 80, 2165 (2002).
- (24) Y. Zhang, A. Chang, J. Cao, Q. Wang, W. Kim, Y. Li, N. Morris, E. Yenilmez, J. Kong, H. Dai, “Electric-field-directed growth of aligned single-walled carbon nanotubes”, *Applied Physics Letters* 79, 3155-3157 (2001).
- (25) R. Chen, N. Franklin, J. Kong, J. Cao, T. Tombler, Y. Zhang, H. Dai, “Molecular photodesorption from single-walled carbon nanotubes”, *Applied Physics Letters* 79, 2258-2260 (2001).
- (26) Y. Li, W. Kim, Y. Zhang, M. Rolandi, D. Wang, H. Dai, “Growth of single-walled carbon nanotubes from discrete catalytic nanoparticles of various sizes”, *Journal Physical Chemistry B* 105, 11424 (2001).
- (27) R. Chen, Y. Zhang, D. Wang, H. Dai, “Noncovalent sidewall functionalization of single-walled carbon nanotubes for protein immobilization”, *Journal of the American Chemical Society* 123, 3838-3839 (2001).
- (28) Y. Zhang, H. Dai, “Formation of metal nanowires on suspended single-walled carbon nanotubes”, *Applied Physics Letters* 77, 3015-3017 (2000).
- (29) Y. Zhang, N. W. Franklin, R. J. Chen, H. Dai, “A study of metal coating on suspended carbon nanotubes: towards elucidating metal-tube interactions”, *Chemical Physics Letters* 331, 35-41 (2000).
- (30) Y. Zhang* and S. Iijima, “Controllable method for fabricating single-wall carbon nanotube tips”, *Applied Physics Letters* 77, 966-968 (2000).
- (31) Y. Zhang* and S. Iijima, “Microstructural evolution of single-walled carbon nanotubes under electron irradiation”, *Philosophical Magazine Letters* 80, 427-433 (2000).
- (32) Y. Zhang*, Z. Shi, Z. Gu, and S. Iijima, “Structure modification of single-wall carbon nanotubes”, *Carbon* 38, 2055-2059 (2000).
- (33) K. Suenaga, Y. Zhang, S. Iijima, “Coiled structure of eccentric coaxial nanocable made of amorphous boron and silicon oxide”, *Applied Physics Letters* 76, 1564-1566 (2000).

- (34) Z. Shi, Y. Lian, F. H. Liao, X. Zhou, Z. Gu, Y. Zhang, S. Iijima, H. Li, K. T. Yue, S-L. Zhang, "Large scale synthesis of single-wall carbon nanotubes by arc-discharge method", *Journal of Physics and Chemistry of Solids* 61, 1031-1036 (2000).
- (35) Z. Shi, Y. Lian, X. Zhou, Z. Gu, Y. Zhang, S. Iijima, Q. Gong, H. Li, and S-L. Zhang, "Single-wall carbon nanotube colloids in polar solvents", *Chemical Communications*, 461-462 (2000).
- (36) H. D. Li, Z. L. Lian, K. T. Yue, Y. Zhan, S. L. Zhang, Z. J. Shi, X. H. Zhou, Y. F. Lian, Z. N. Gu, B. B. Liu, R. S. Yang, H. B. Yang, G. T. Zou, Y. Zhang, and S. Iijima, "Temperature dependence of the Raman spectra of single-wall carbon nanotubes", *Applied Physics Letters* 76, 2053-2055 (2000).
- (37) Y. Zhang* and S. Iijima, "Formation of single-wall carbon nanotubes by laser ablation of fullerenes at low temperature", *Applied Physics Letters* 75, 3087-3089 (1999).
- (38) Z. Shi, Y. Lian, X. Zhou, Z. Gu, Y. Zhang, S. Iijima, H. Li, K. T. Yue, S-L. Zhang, "Production of single-wall carbon nanotubes at high pressure", *Journal of Physical Chemistry B* 103, 8698-8701 (1999).
- (39) Z. Shi, Y. Lian, F. Liao, X. Zhou, Z. Gu, Y. Zhang, S. Iijima, "Purification of single-wall carbon nanotubes", *Solid State Communications* 112, 35-37 (1999).
- (40) O. Lourie, H. D. Wagner, Y. Zhang, and S. Iijima, "Dependence of elastic properties on morphology in single-wall carbon nanotubes", *Advanced Materials* 11, 931-934 (1999).
- (41) Y. Zhang* and S. Iijima, "Elastic response of carbon nanotube bundles to visible light", *Physical Review Letters* 82, 3472-3475 (1999).
- (42) Y. Zhang*, S. Iijima, Z. Shi, and Z. Gu, "Defects in arc-discharge-produced single-walled carbon nanotubes", *Philosophical Magazine Letters* 79, 473-479 (1999).
- (43) Z. Shi, Y. Lian, X. Zhou, Z. Gu, L. Zhou, K. T. Yue, S. Zhang, Y. Zhang, S. Iijima, "Mass-production of single-wall carbon nanotubes by arc discharge method", *Carbon* 37, 1449-1453 (1999).
- (44) Y. Zhang*, T. Ichihashi, E. Landree, F. Nihey, and S. Iijima, "Heterostructures of single-walled carbon nanotubes and carbide nanorods", *Science* 285, 1719-1722 (1999).
- (45) Y. Zhang*, K. Suenaga, C. Colliex, and S. Iijima, "Coaxial nanocable: Silicon carbide and silicon oxide sheathed with boron nitride and carbon", *Science* 281, 973-975 (1998).
- (46) Y. Zhang*, H. Gu, and S. Iijima, "Single-wall carbon nanotubes synthesized by laser ablation in a nitrogen atmosphere", *Applied Physics Letters* 73, 3827-3829 (1998).
- (47) Y. Zhang and S. Iijima, "Microscopic structure of as-grown single-wall carbon nanotubes by laser ablation", *Philosophical Magazine Letters* 78, 139-144 (1998).
- (48) Y. Zhang*, H. Gu, K. Suenaga, and S. Iijima, "Heterogeneous growth of B-C-N nanotubes by laser ablation", *Chemical Physics Letters* 279, 264-269 (1997).
- (49) Y. Zhang, H. Ichinose, M. Nakanose, K. Ito, and Y. Ishida, "Structure modeling of Σ3 and Σ9 coincident boundaries in CVD diamond thin films", *Journal of Electron Microscopy* 48, 245-251 (1999).
- (50) K. Kohyama, H. Ichinose, Y. Zhang, Y. Ishida and M. Nakanose, "Tight-binding calculation of the {211} Σ=3 boundary in diamond", *Interface Science* 4, 157-167 (1997).
- (51) H. Ichinose, M. Nakanose, Y. Zhang, "Atomic and electron structure of diamond grain boundaries in a polycrystalline film", *Materials Research Society symposium proceedings* 472, 93-98 (1997).

- (52) H. Ichinose, Y. Zhang, Y. Ishida, K. Ito, and M. Nakanose, "Application of spatially resolved EELS on atomic structure determination of diamond grain boundary", *Materials Research Society Symposium Proceedings* 466, 273-278 (1997).
- (53) Y. Zhang, H. Ichinose, M. Nakanose, K. Ito, and Y. Ishida, "Transmission electron microscopic observation of grain boundaries in CVD diamond thin films", *Journal of Electron Microscopy* 45, 436-441 (1996).
- (54) Y. Zhang, H. Ichinose, Y. Ishida, K. Ito, and M. Nakanose, "Atomic and electronic structures of grain boundary in chemical vapor deposited diamond thin film", *Materials Research Society Symposium Proceedings* 416, 355-360 (1996).
- (55) Y. Zhang, H. Ichinose, K. Ito, Y. Ishida, and M. Nakanose, "Grain boundary structure and growth sequence of diamond thin film", *Materials Science Forum* 204-206, 207-214 (1996).
- (56) H. Ichinose, Y. Zhang, Y. Ishida, and M. Nakanose, "Morphology, atomic structure and electronic structure of artificial diamond grain boundary", *JEOL News* Vol. 32E, No. 1, p. 16, 1996
- (57) Y. Zhang, H. Ichinose, Y. Ishida, and M. Nakanose, "HRTEM of grain boundaries in diamond thin film", *Proceedings of the 2nd NIRIM International Symposium on Advanced Materials (ISAM'95)*, 271-274 (1995).
- (58) Y. Ishida, Y. Zhang, T. Katoh, H. Ichinose, "High resolution transmission electron microscopy of a segregated aluminum grain boundary and of diamond grain boundaries", *Annales de Physique C3* 20, 83-89 (1995).
- (59) Y. Zhang, S. Fan, C. Shi, Z. Niu, and B. Gu, "In-situ fabrication of YBCO/YSZ/Si thin films by laser ablation", *Physica C* 185-189, 1997-1998 (1991).
- (60) Y. Zhang, C. Shi, S. Fan, C. Cui, S. Li, J. Li, and M. Liu, "Preparation and critical current measurements of laser ablated YBCO superconducting thin films", *Chinese Physics Letters* 8, 416-419 (1991).
- (61) Y. Zhang, C. Shi, S. Fan, "In-situ fabrication of superconducting YBCO thin films by PLD method", *Cryogenics and Superconductivity* (In Chinese), Vol.19, No.1, p. 45-47, 1991.

Book Chapters:

- (62) Y. Zhang*, "Composite Nanowires", in *Nanowires and Nanobelts*, ed. Zhong Lin Wang, Kluwer Academic Publishers, Boston, 2003, Vol. 2, pp. 257-268.
- (63) Y. Zhang*, W. Han, G. Gu, "Nanocables and Nanojunctions", in *Encyclopedia of Nanoscience and Nanotechnology*, ed. H. S. Nalwa, American Scientific Publishers, 2004, Vol. 6, pp. 61-76.
- (64) Y. Zhang*, "Carbon nanotube based nonvolatile memory devices", in *Nanotubes and Nanowires*, ed. P. J. Burke, World Scientific Publishing Co., Singapore, 2007, pp.77-93.

CONFERENCE PRESENTATIONS

- (1) Y. Zhang, "Chemical Vapor Deposition of Graphene Films on Dielectric Substrate", 2010 International Chemical Congress of Pacific Basin Societies (PacifiChem 2010), Honolulu, Hawaii, Dec. 15-20, 2010.
- (2) A. Ismach, Z. Tan, Y. Zhang*, "Tuning Sub-micron Graphene Structures on Dielectric Surfaces by Controlled De-wetting of Metal Catalyst Layers", Materials Research Society (MRS) 2010 Fall Meeting, Boston, MA, Nov. 29 - Dec. 3, 2010.
- (3) **Invited Talk:** G. Xu, Y. Zhang*, K. L. Wang, "Effect of Spatial Charge Inhomogeneity on 1/f Noise Behavior in Graphene", the International Conference on Superlattices, Nanostructures and Nanodevices (ICSNN-2010), Beijing, China, July 18-23, 2010.
- (4) G. Xu, J. Bai, C. M. Torres Jr., E. B. Song, Y. Zhou, X. Duan, Y. Zhang, Y. Huang and K. L. Wang, "Nanowire-mask based fabrication of high mobility and low noise graphene nanoribbon short-channel field-effect transistors", Device Research Conference (DRC), South Bend, Indiana, June 21-23, 2010.
- (5) Y. Zhang, J. R. McDonough, Y. Cui, "Carbon-based Three-dimensionally Nanostructured Supercapacitor Electrodes", 2010 International Conference on Advanced Capacitors (ICAC2010), Kyoto, Japan, May 31 - June 2, 2010.
- (6) J. R. McDonough, J. W. Choi, Y. Yang, F. La Mantia, Y. Zhang, and Y. Cui, "Carbon Nanostructured Supercapacitors with Large Areal Capacitances", 217th Electrochemical Society (ECS) Meeting, Vancouver, Canada, April 25-30, 2010.
- (7) A. Ismach, C. Druzgalski, S. Penwell, M. Zheng, A. Javey, J. Bokor, Y. Zhang, "Direct chemical vapor deposition of single and few--graphene layers on dielectric surfaces", American Physical Society (APS) March Meeting 2010, Portland, Oregon, March 15–19, 2010.
- (8) G. Xu, C. M. Torres Jr., Y. Zhang, F. Liu, M. Wang, Y. Zhou, C. Zeng, and K. L. Wang, "Electron-hole puddle induced scattering and 1/f noise behavior", American Physical Society (APS) March Meeting 2010, Portland, Oregon, March 15–19, 2010.
- (9) Y. Zhang, "Carbon Nanomaterials for Nanoelectronics and Energy", The Molecular Foundry and ALS User's Meeting 2009, Berkeley, California, Oct.15-16, 2009.
- (10) N. Tayebi, Y. Narui, N. Franklin, C. P. Collier, K. P. Giapis, and Y. Zhang, "Single-digit nanometer domain formation using carbon nanotube-based nanopencil probes", NT09: 10th International Conference on the Science and Application of Nanotubes, Beijing, China, June 21-26, 2009.
- (11) A. Ismach, R. Tangirala, Y. Zhang, "Directional Etching of Graphene by Catalytic Silver Nanoparticles", The U.S. Department of Energy Nanoscale Science Research Centers (NSRCs) Contractors' Meeting, Annapolis, Maryland, June 3-5, 2009.
- (12) D. Ielmini and Y. Zhang, "Physics-based analytical model of chalcogenide-based memories for array simulation", 2006 IEDM (International Electron Devices Meeting), Dec. 11 – 13, 2006, San Francisco, CA.
- (13) **Invited Talk:** Y. Zhang, "Carbon nanotube based non-volatile memory and charge sensors", SPIE – OpticsEast 2005, Oct. 24, 2005. Boston, MA.

- (14) **Invited Talk:** Y. Zhang, "Carbon Nanotube Based Nano-Floating Gate Memory", 2005 Materials Research Society (MRS) Spring Meeting, March 28 - April 1, 2005, San Francisco, CA.
- (15) **Invited Talk:** Y. Zhang, "Optical Trapping and In-situ Raman Spectroscopy of Soluble Carbon Nanotubes", 229th American Chemical Society (ACS) National Meeting, March 13-17, 2005, San Diego, CA.
- (16) **Invited Talk:** Y. Zhang, "An optical method for trapping and detection of single-walled carbon nanotubes in aqueous solution", SPIE – OpticsEast 2004, Philadelphia, Pennsylvania, Oct. 25, 2004.
- (17) **Invited Talk:** Y. Zhang, "Optical trapping of water-soluble single-walled carbon nanotubes", The 31st Annual Meeting of Federation of Analytical Chemistry and Spectroscopy Societies (FACSS), Portland, Oregon, Oct. 4, 2004.
- (18) **Invited Talk:** M. Liao, R. Chen, H. Lopez, Y. Zhang, "Manipulation of Single-Walled Carbon Nanotubes into Aligned Arrays", Northern California Chapter AVS 2004 Annual Symposium, Sept. 13, 2004, San Jose, CA.
- (19) **Invited Talk:** Y. Zhang, "Synthesis and alignment of carbon nanotubes", American Physical Society (APS) 2002 March Meeting, Indianapolis, USA, March 2002.
- (20) Y. Zhang, S. Iijima, "Light-induced elastic and electrical behaviors of carbon nanotube bundles", 196th Meeting of the Electrochemical Society, Honolulu, Hawaii, October 17-22, 1999.
- (21) Y. Zhang, Z. Shi, Z. Gu, S. Iijima, "Microstructures of purified single-wall carbon nanotubes", The 17th Fullerene Symposium (Fullerene Research Association, The Chemical Society of Japan), Gifu, Japan, Aug. 1999.
- (22) Y. Zhang, T. Ichihashi, E. Landree, S. Iijima, "Diffusive reaction of silicon and refractory metals on carbon nanotubes", American Physical Society (APS) Centennial Meeting, Atlanta, USA, Mar. 1999.
- (23) Y. Zhang, K. Suenaga, C. Colliex and S. Iijima, "Structure of nanocables", The 16th Fullerene Symposium (Fullerene Research Association, The Chemical Society of Japan), Okasaki, Japan, Jan. 1999.
- (24) **Invited Talk:** Y. Zhang, "Synthesis and microscopic characterization of nanotubular structures", Materials Science Forum (Tsinghua University), Beijing, China, Nov. 1998.
- (25) Y. Zhang, S. Iijima, "Behaviors of carbon nanotubes under light illumination", 1998 Fall Sectional Meeting of the Physical Society of Japan, Okinawa, Japan, Sept. 1998.
- (26) Y. Zhang, H. Gu, and S. Iijima, "Single-wall carbon nanotubes synthesized by laser ablation in nitrogen gas", The 15th Fullerene Symposium (Fullerene Research Association, The Chemical Society of Japan), Matsushima, Japan, July 1998.
- (27) Y. Zhang, E. Landree, and S. Iijima, "Processing of single-wall carbon nanotubes for nano-electronic application", European Materials Research Society (E-MRS) 1998 Spring Meeting, Strasbourg, France, June 1998.
- (28) Y. Zhang, K. Suenaga, H. Gu, and S. Iijima, "Synthesis of carbon-BN and related composite nanotubular structures by laser ablation", American Physical Society (APS) 1998 March Meeting, Los Angeles, USA, Mar. 1998.
- (29) Y. Zhang and S. Iijima, "TEM observation of *in-situ* deposited SWCNT by laser ablation", The 14th Fullerene Symposium (Fullerene Research Association, The Chemical Society of Japan), Okasaki, Japan, Jan. 1998.

- (30) Y. Zhang, H. Ichinose, Y. Ishida, K. Ito, and M. Nakanose, "Atomic structures of grain boundaries in CVD diamond thin film", Materials Research Society (MRS) 1996 Fall Meeting, Boston, USA, Dec. 1996.
- (31) Y. Zhang, H. Ichinose, Y. Ishida, K. Ito, and M. Nakanose, "Computer simulation of the atomic structure images on diamond $\bar{1}3$ boundary", The Japan Institute of Metals 1996 Fall Meeting, Sapporo, Japan, Sept. 1996.
- (32) Y. Zhang, H. Ichinose, M. Kohyama, Y. Ishida, K. Ito, and M. Nakanose, "Structure determination of diamond grain boundary by HREM and computer image simulation", The 8th International Symposium on Crystal Growth (The Japan Institute of Metals), Toyama, Japan, Aug. 1996.
- (33) Y. Zhang, H. Ichinose, K. Ito, Y. Ishida and M. Nakanose, "Interface structure of CVD diamond thin film on Si substrate", The 117th Meeting of the Japan Institute of Metals, as International Symposia on Advanced Materials and Technology for the 21st Century, Hawaii, USA, Dec. 1995.
- (34) Y. Zhang, H. Ichinose, Y. Ishida, K. Ito, and M. Nakanose, "Atomic and electronic structures of grain boundary in chemical vapor deposited diamond thin film", Materials Research Society (MRS) 1995 Fall Meeting, Boston, USA, Nov. 1995.
- (35) H. Ichinose, Y. Zhang, K. Ito, Y. Ishida, and M. Nakanose, "HRTEM and FEG-EELS analyses on diamond grain boundaries", The 11th Forum on Analytical Electron Microscopy, Tokyo, Japan, Sept. 1995.
- (36) Y. Zhang, H. Ichinose, K. Ito, Y. Ishida, and M. Nakanose, "Structure analysis of $\Sigma 9$ boundary in diamond thin films", The Japan Institute of Metals 1995 Spring Meeting, Tokyo, Japan, Apr. 1995.
- (37) Y. Zhang, H. Ichinose, Y. Ishida, and M. Nakanose, "HRTEM of grain boundaries in diamond thin film", The 2nd NIRIM International Symposium on Advanced Materials (ISAM'95), Tsukuba, Japan, March 1995.
- (38) Y. Zhang, T. Ichimori, T. Ishii, H. Ichinose, K. Ito, Y. Ishida, and M. Nakanose, "High resolution electron microscopic observation of grain boundaries in diamond thin films", The Japan Institute of Metals 1994 Fall Meeting, Kyushu, Japan, Oct. 1994.
- (39) H. Ichinose, Y. Zhang, M. Nakanose, K. Ito, and Y. Ishida, "High resolution electron microscopy on diamond grain boundaries", The Japan Institute of Metals 1994 Spring Meeting, Tokyo, Japan, Apr. 1994.
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